

Name: \_\_\_\_\_

Period: \_\_\_\_\_

Date: \_\_\_\_\_

## Unit 4 Practice Test: The Periodic Table

### Part 1: Matching

Match each description in Column B with the correct term in Column A. Write the letter of the correct description on the line.

#### Column A

\_\_\_\_\_ 1. Valence electrons

\_\_\_\_\_ 2. Octet rule

\_\_\_\_\_ 3. Atomic radius

\_\_\_\_\_ 4. Electronegativity

\_\_\_\_\_ 5. Ionization energy

\_\_\_\_\_ 7. Why atomic radius increases  
down a group\_\_\_\_\_ 8. Why ionization energy  
increases across a period

#### Column B

a. distance between an atom's nucleus and its valence electrons

b. how much energy is needed to remove an electron from an  
atomc. because atoms with more energy levels have a bigger atomic  
radius

d. electrons farthest away from the nucleus

e. because the atom is getting closer to having 8 valence  
electrons, so it doesn't want to give any away

f. atoms are most stable when they have 8 valence electrons

g. how much an element wants 1 more electron

GIVE = +

TAKE = -

### Part 2: Valence Electrons and Charge

Complete the table below.

Element	# of Valence Electrons	Give or Take Electrons?	# of Electrons to Give or Take	Charge
Hydrogen				
Magnesium				
Fluorine				
Carbon				
Nitrogen				

### Part 3: Metals, Nonmetals, and Metalloids

1. Decide whether each property below describes a metal, nonmetal, or metalloid. Write the number of each property in the correct box below.

- |   |  |
|---|--|
| 1. Brittle/fragile                              | 7. High melting points (solid at room temperature)         |
| 2. Can be reactive                              | 8. Low melting points (most are gases at room temperature) |
| 3. Conduct electricity                          | 9. Malleable (can change shape without breaking)           |
| 4. Don't conduct electricity                    | 10. Semi-conductors of electricity                         |
| 5. Dull   | 11. Shiny  |
| 6. Have properties of both metals and nonmetals |  |

Metals	Nonmetals	Metalloids

2. Determine whether the following elements are metals, nonmetals, or metalloids. Then list the element's periodic family (alkali metal, halogen, noble gas, alkaline earth metal, or transition metal), group, and period.

Element	Metal, Nonmetal or Metalloid?	Periodic Family	Group	Period
Potassium				
Niobium				
Neon				
Astatine				
Barium				

3. While walking home, you discover a disgusting substance on the bottom of your shoe. You decide to run some tests, and figure out that it's a malleable Group 5 element that conducts electricity.

a. Do you think it's a metal, nonmetal, or metalloid? \_\_\_\_\_

b. Give 2 reasons to justify your answer (complete sentences).

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c. Which periodic family does it belong to? \_\_\_\_\_

4. While hiking a mountain, you and your friends capture a sample of gas in a bottle and decide to run some tests on it to figure out which element you've found. The element is in Group 17, has a low melting point, and doesn't conduct electricity.

a. Do you think it's a metal, nonmetal, or metalloid? \_\_\_\_\_

b. Give 2 reasons to justify your answer (complete sentences).

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c. Which periodic family does it belong to? \_\_\_\_\_

5. Ms. Eggleston is reading a novel in which one character poisons her husband with the element ARSENIC! Arsenic is reactive and is a semi-conductor of electricity.

a. Is arsenic a metal, nonmetal, or metalloid? \_\_\_\_\_

b. Give 2 reasons to justify your answer (complete sentences).

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#### Part 4: Periodic Trends

1. Arrange the following elements in order from smallest to largest atomic radius.

a. C, N, Be, O \_\_\_\_\_

b. Fe, Cs, Sr, Nb \_\_\_\_\_

2. Arrange the following elements in order from smallest to largest electronegativity.

a. Ca, Sr, Be, Rb \_\_\_\_\_

b. Fe, Cs, Sr, Nb \_\_\_\_\_

3. Arrange the following elements in order from smallest to largest ionization energy.

a. P, Co, Al, S \_\_\_\_\_

b. F, Ni, N, K \_\_\_\_\_

## Part 5: Shielding Electrons

Complete the table below using your knowledge of effective nuclear charge and shielding electrons. Use the hints in the first row to help you with your calculations.

Element	Nuclear Charge (atomic number)	Total electrons (atomic number)	Valence electrons	Shielding electrons (total – valence)	Charge “felt” by valence electrons (nuclear charge – shielding electrons)
Potassium					
Carbon					
Neon					
Bromine					
Arsenic					

Steps	Example: Sodium		
	Energy Level	# of Electrons	Charge “felt” by electrons in this energy level
	1 <sup>st</sup>		
	2 <sup>nd</sup>		
	3 <sup>rd</sup>		

